



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2020-0465; Product Identifier 2020-NM-074-AD; Amendment 39-21363; AD 2020-26-08]

RIN 2120-AA64

Airworthiness Directives; The Boeing Company Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for The Boeing Company Model 787-8, 787-9, and 787-10 airplanes powered by Rolls Royce Trent 1000 engines. This AD was prompted by reports of damage to the inner fixed structure (IFS) forward upper fire seal and damage to thermal insulation blankets in the forward upper area of the thrust reverser (TR). This AD requires repetitive inspections of the IFS forward upper fire seal and thermal insulation blankets in the forward upper area of the TR for damage and applicable on-condition actions. The FAA is issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: For service information identified in this final rule, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminister Blvd., MC 110-SK57, Seal Beach, CA 90740-5600; telephone 562-797-

1717; Internet <https://www.myboeingfleet.com>. You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206-231-3195. It is also available on the Internet at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2020-0465.

Examining the AD Docket

You may examine the AD docket on the Internet at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2020-0465; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, any comments received, and other information. The address for Docket Operations is U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: Tak Kobayashi, Aerospace Engineer, Propulsion Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA; phone: 206-231-3553; email: Takahisa.Kobayashi@faa.gov.

SUPPLEMENTARY INFORMATION:

Discussion

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to The Boeing Company Model 787-8, 787-9, and 787-10 airplanes powered by Rolls Royce Trent 1000 engines. The NPRM published in the *Federal Register* on June 16, 2020 (85 FR 36352). The NPRM was prompted by reports of damage to the IFS forward upper fire seal and damage to thermal insulation blankets in the forward upper area of the TR. The NPRM proposed to require repetitive inspections of the IFS forward upper fire seal and thermal insulation blankets in the forward upper area of the TR for damage and applicable on-condition actions.

The FAA is issuing this AD to address damage to the IFS forward upper fire seal and the thermal insulation blankets of the TR due to airflow through structural gapping that could occur at the interface between the leading edge of the IFS and the engine splitter structure during flight. Failure of the IFS forward upper fire seal could cause the loss of seal pressurization and degrade the ability to detect and extinguish an engine fire, resulting in an uncontrolled fire. Damage to the TR insulation blanket could result in thermal damage to the TR inner wall, the subsequent release of engine exhaust components, and consequent damage to critical areas of the airplane. Furthermore, damage to the TR inner wall and IFS forward upper fire seal could compromise the integrity of the firewall and its ability to contain an engine fire, resulting in an uncontrolled fire.

Comments

The FAA gave the public the opportunity to participate in developing this final rule. The following presents the comments received on the NPRM and the FAA's response to each comment.

Request for Clarification on Whether the Unsafe Condition is Likely to Exist on Other New Products

An individual commenter asked how likely it is that the same unsafe condition addressed in the proposed AD is to occur on other new products that are currently being evaluated for certification by the FAA, including the Boeing Model 777X. The commenter stated that the use of an electric thruster instead of a hydraulically-driven thrust reverser actuator would reduce the maintenance of a hydraulic system, and eliminate potential corrosion and fire risk.

The FAA agrees to clarify. As required by 14 CFR 21.21(b)(2), to certify an aircraft, the FAA must find that no feature or characteristic makes the aircraft unsafe. If the unsafe condition identified in this AD is determined to exist on any product that has

not been certified by the FAA, the unsafe condition must be adequately addressed prior to FAA certification of that product. No change to this final rule is necessary in this regard.

Request for Explanation Regarding Timing of AD Action

The individual commenter asked why there was a 36 month period after August 27, 2018 (the effective date of AD 2018-15-03 Amendment 39-19335 (83 FR 34753, July 23, 2018) (AD 2018-15-03)), to take action on Boeing Alert Service Bulletin B787-81205-SB780033-00, Issue 001, dated November 1, 2017, which is required by AD 2018-15-03. The FAA infers that the commenter is referring to the 36-month compliance time for accomplishing the actions described in Boeing Alert Service Bulletin B787-81205-SB780033-00, Issue 001, dated November 1, 2017. The FAA also infers that the commenter is concerned regarding the time it took the FAA to take AD action to address the unsafe condition.

The FAA agrees to provide clarification regarding the timing of the publication of AD 2018-15-03 and the relationship between AD 2018-15-03 and this final rule. In the preamble of the NPRM preceding this final rule, the FAA stated that the proposed AD would not supersede or terminate any requirement of AD 2018-15-03. AD 2018-15-03 and this final rule both address damage to the IFS forward upper fire seal and damage to the thrust reverser thermal blanket. However, the damage to these areas is the result of two different causes. When the FAA developed AD 2018-15-03, that AD addressed the cause of damage that was identified at that time. The FAA assessed the level of risk and the compliance time, so that mandatory actions would be accomplished as soon as reasonably practical while maintaining an acceptable level of safety during the compliance period. The FAA determined that a compliance time of 36 months was adequate to address the unsafe condition identified in AD 2018-15-03.

After AD 2018-15-03 was issued, Boeing identified an additional cause of the unsafe condition that was different from the one specified in AD 2018-15-03. This newly

identified cause could similarly result in damage to the IFS forward upper fire seal and the thrust reverser thermal blanket. This final rule addresses the newly identified cause of the unsafe condition that was identified after AD 2018-15-03 was issued. As discussed in the preamble of the NPRM and the preamble of this final rule, the actions required by this final rule are interim action and the FAA may consider further rulemaking when a final corrective action becomes available.

No change to this final rule is necessary in regard to this comment.

Request for Clarification Regarding Inspection Personnel

The individual commenter also asked for clarification regarding what type of inspector would perform the inspections of the IFS forward upper fire seal and thermal blanket specified in the proposed AD. The commenter asked if the inspections would be performed by flight line inspectors or FAA inspectors.

The FAA agrees to provide clarification. The inspections required by this AD will be performed by qualified and certified maintenance personnel employed by airlines and airplane operators. No change to this final rule is necessary in this regard.

Request to Clarify the Unsafe Condition

Boeing requested that the Discussion section and paragraph (e) of the proposed AD be revised to clarify the unsafe condition. The commenter stated that the unsafe condition statement in the proposed AD was not accurate. However, the commenter did not provide an explanation as to why the unsafe condition statement was not accurate.

The commenter indicated that in both the Discussion section and paragraph (e) of the proposed AD the explanation of the unsafe condition should be changed by removing the phrase “the loss of seal pressurization” from “Failure of the IFS forward upper fire seal could cause the loss of seal pressurization and degrade the ability to detect and extinguish an engine fire, resulting in an uncontrolled fire,” and replace it with the phrase “excessive airflow into the core compartment firezone.”

The commenter also requested that in both the Discussion section and paragraph (e) of the proposed AD the explanation of the unsafe condition be changed by removing the phrase “the subsequent release of engine exhaust components, and consequent damage to critical areas of the airplane” from “Damage to the TR insulation blanket could result in thermal damage to the TR inner wall, the subsequent release of engine exhaust components, and consequent damage to critical areas of the airplane,” and replace it with the phrase “compromising the integrity of the firewall barrier which would increase the risk of an uncontained fire.”

The FAA agrees with the commenter’s request to clarify that damage to the TR inner wall could increase the risk of an uncontained fire. The FAA concurs that, depending on the level of damage to the TR inner wall and IFS forward upper fire seal, the capability of the firewall to contain an engine fire could be compromised, and therefore, it could result in an uncontrolled fire. The FAA also considers that damage to the IFS forward upper fire seal has the same effect. Although the FAA has already identified the potential for an uncontrolled fire as part of the unsafe condition addressed by this AD, the FAA has revised the Discussion section and paragraph (e) of this AD to provide additional clarification on this point.

The FAA disagrees with the commenter’s request to remove the reference to “loss of seal pressurization and” from the description of the unsafe condition. This final rule addresses structural gapping that could occur between the leading edge of the IFS and the engine splitter structure during flight. Airflow through this structural gapping could damage the IFS forward upper fire seal and the thrust reverser thermal blanket. When the IFS forward fire seal is damaged, airflow can pass through the damaged areas of the IFS forward fire seal in addition to airflow through structural gapping, and this condition could further degrade the ability to detect and extinguish an engine fire, and also damage the TR thermal blanket. The FAA’s intent was to explain the effect of airflow through the

damaged IFS forward fire seal due to loss of seal pressurization caused by the failure of the IFS forward upper fire seal. The FAA has not revised this AD in this regard.

The FAA also disagrees with the commenter's request to remove "the subsequent release of engine exhaust components, and consequent damage to critical areas of the airplane" from the description of the unsafe condition. The FAA has identified the potential of engine components departing the airplane due to damage to the TR inner wall as part of the unsafe condition addressed in this AD. This failure effect has been similarly discussed and addressed in a number of previously issued ADs including AD 2018-15-03, which is related to this AD. This AD has not been revised in this regard.

Request to Revise the Proposed Cost Estimates

Boeing requested that the cost estimate in the NPRM be revised. Boeing stated that it initially communicated to the FAA that the manpower estimate of 0.5 man-hour for fire seal inspection and 0.5 man-hour for thermal blanket inspection was meant to be per engine, instead of per thrust reverser half as the FAA considered under the estimated cost provided in the NPRM. Boeing explained that the corrected manpower estimate for the fire seal inspection should be 0.25 man-hour per thrust reverser half, and the corrected manpower estimate for the thermal blanket inspection should be 0.25 man-hour per thrust reverser half. Boeing recommended that instead of 4 work-hours X \$85 per hour = \$340 per inspection cycle, the FAA update the labor cost for the inspection to 2 work-hours for a cost of \$170 per inspection cycle. Boeing asserted that this would change the cost on U.S. operators to \$2,380 per inspection cycle, based on 14 U.S. airplanes.

The FAA agrees with Boeing's observation that the cost estimate in the NPRM was incorrect based upon information that was incorrectly communicated from Boeing to the FAA. The FAA has revised the Costs of Compliance in this final rule.

Conclusion

The FAA reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this final rule with the changes described previously and minor editorial changes. The FAA has determined that these minor changes:

- Are consistent with the intent that was proposed in the NPRM for addressing the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the NPRM.

The FAA also determined that these changes will not increase the economic burden on any operator or increase the scope of this final rule.

Related Service Information under 1 CFR Part 51

The FAA reviewed Boeing Alert Requirements Bulletin B787-81205-SB780041-00 RB, Issue 001, dated March 31, 2020. The service information describes procedures for repetitive inspections of the IFS forward upper fire seal and thermal insulation blankets of the TR for damage and applicable on-condition actions. Damage to a forward upper fire seal includes cuts, splits, nicks, punctures, and missing sections. Damage to an upper thermal blanket includes tears, cuts, missing metal skin, missing insulation, and over-temperature conditions shown by discoloration or scorching. The on-condition actions include replacing any damaged forward upper fire seal with a new fire seal having an appropriate part number, and replacing any damaged forward upper thermal blanket with a new thermal blanket. This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in the ADDRESSES section.

Interim Action

The FAA considers this AD interim action. If final action is later identified, the FAA might consider further rulemaking then.

Costs of Compliance

The FAA estimates that this AD affects 14 airplanes of U.S. registry. The FAA estimates the following costs to comply with this AD:

Estimated costs for required actions

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Inspection	2 work-hours X \$85 per hour = \$170 per inspection cycle	\$0	\$170 per inspection cycle	\$2,380 per inspection cycle

The FAA estimates the following costs to do any necessary on-condition actions that would be required. The FAA has no way of determining the number of aircraft that might need these on-condition actions:

Estimated costs of on-condition actions

Action	Labor cost	Parts cost	Cost per product
Fire seal replacement	2 work-hours X \$85 per hour = \$170 per TR half	\$1,365 per TR half	\$1,535 per TR half (4 TR halves per airplane)
Thermal blanket replacement	1 work-hour X \$85 per hour = \$85 per TR half	\$17,855 per TR half	\$17,940 per TR half (4 TR halves per airplane)

According to the manufacturer, some or all of the costs of this AD may be covered under warranty by Goodrich, thereby reducing the cost impact on affected individuals. The FAA does not control warranty coverage for affected individuals. As a result, the FAA has included all known costs in the cost estimate.

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator.

Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

This AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a "significant regulatory action" under Executive Order 12866,
- (2) Will not affect intrastate aviation in Alaska, and
- (3) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

Adoption of the Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by adding the following new airworthiness directive (AD):

2020-26-08 The Boeing Company: Amendment 39-21363; Docket No. FAA-2020-0465; Product Identifier 2020-NM-074-AD.

(a) Effective Date

This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

None.

(c) Applicability

This AD applies to The Boeing Company Model 787-8, 787-9, and 787-10 airplanes, certificated in any category, powered by Rolls Royce Trent 1000 engines.

(d) Subject

Air Transport Association (ATA) of America Code 78, Engine Exhaust.

(e) Unsafe Condition

This AD was prompted by reports of damage to the inner fixed structure (IFS) forward upper fire seal and damage to thermal insulation blankets in the forward upper area of the thrust reverser (TR). The FAA is issuing this AD to address the damage to the IFS forward upper fire seal and the thermal insulation blankets of the TR due to airflow through structural gapping that could occur at the interface between the leading edge of the IFS and the engine splitter structure during flight. Failure of the IFS forward upper fire seal could cause the loss of seal pressurization and degrade the ability to detect and extinguish an engine fire, resulting in an uncontrolled fire. Damage to the TR insulation blanket could result in thermal damage to the TR inner wall, the subsequent release of

engine exhaust components, and consequent damage to critical areas of the airplane. Furthermore, damage to the TR inner wall and IFS forward upper fire seal could compromise the integrity of the firewall and its ability to contain an engine fire, resulting in an uncontrolled fire.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Required Actions

Except as specified by paragraph (h) of this AD: At the applicable times specified in the “Compliance” paragraph of Boeing Alert Requirements Bulletin B787-81205-SB780041-00 RB, Issue 001, dated March 31, 2020, do all applicable actions identified in, and in accordance with, the Accomplishment Instructions of Boeing Alert Requirements Bulletin B787-81205-SB780041-00 RB, Issue 001, dated March 31, 2020.

Note 1 to paragraph (g): Guidance for accomplishing the actions required by this AD can be found in Boeing Alert Service Bulletin B787-81205-SB780041-00, Issue 001, dated March 31, 2020, which is referred to in Boeing Alert Requirements Bulletin B787-81205-SB780041-00 RB, Issue 001, dated March 31, 2020.

(h) Exceptions to Service Information Specifications

Where Boeing Alert Requirements Bulletin B787-81205-SB780041-00 RB, Issue 001, dated March 31, 2020, uses the phrase “the Issue 001 date of Requirements Bulletin B787-81205-SB780041-00 RB,” this AD requires using “the effective date of this AD.”

(i) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Seattle ACO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in

paragraph (j)(1) of this AD. Information may be emailed to: 9-ANM-Seattle-ACO-AMOC-Requests@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(3) An AMOC that provides an acceptable level of safety may be used for any repair, modification, or alteration required by this AD if it is approved by The Boeing Company Organization Designation Authorization (ODA) that has been authorized by the Manager, Seattle ACO Branch, FAA, to make those findings. To be approved, the repair method, modification deviation, or alteration deviation must meet the certification basis of the airplane, and the approval must specifically refer to this AD.

(j) Related Information

(1) For more information about this AD, contact Tak Kobayashi, Aerospace Engineer, Propulsion Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA; phone: 206-231-3553; email: Takahisa.Kobayashi@faa.gov.

(2) Service information identified in this AD that is not incorporated by reference is available at the addresses specified in paragraphs (k)(3) and (4) of this AD.

(k) Material Incorporated by Reference

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) Boeing Alert Requirements Bulletin B787-81205-SB780041-00 RB, Issue 001, dated March 31, 2020.

(ii) [Reserved]

(3) For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminister Blvd., MC 110-SK57, Seal Beach, CA 90740-5600; telephone 562-797-1717; Internet <https://www.myboeingfleet.com>. You may view this referenced service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206-231-3195.

(4) You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206-231-3195.

(5) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, email fedreg.legal@nara.gov, or go to: <https://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued on December 9, 2020.

Lance T. Gant, Director,
Compliance & Airworthiness Division,
Aircraft Certification Service.

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